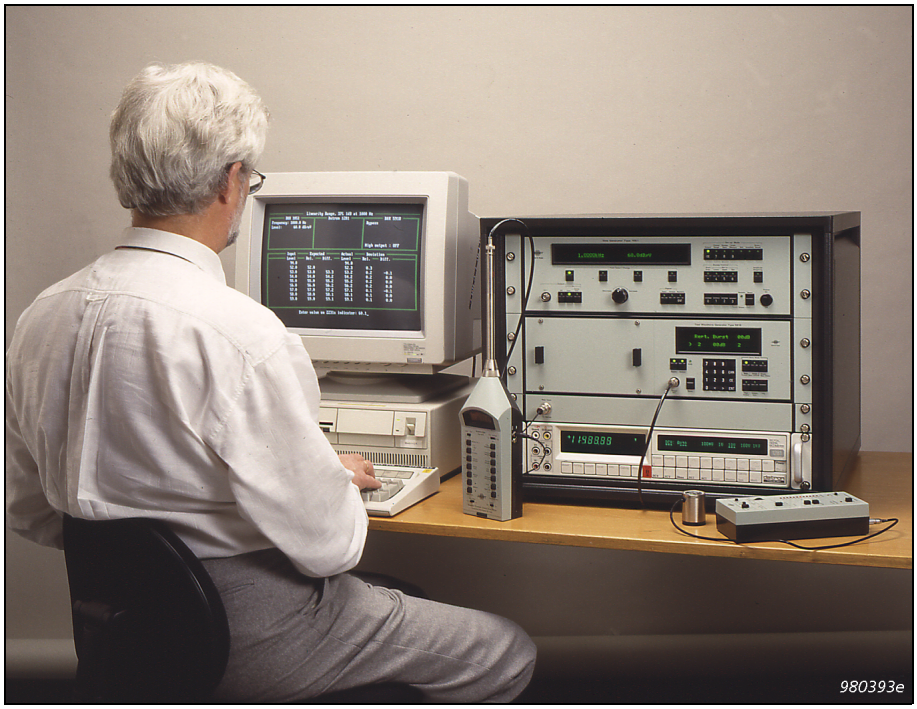
PRODUCT DATA

Sound Level Meter Calibration System — Type 9600



The System

The system performs both acoustic and electrical tests. For electrical tests, the sound level meter's microphone is replaced with a capacitor and the system, controlled by PC software, sends a signal to the sound level meter.

Readings are taken either from the sound level meter's display and then manually entered into the computer or from the sound level meter's DC output (if available) and recorded by the system voltmeter.

On completing the electrical calibration, the microphone is replaced and an acoustic calibration is performed using a traceable calibrated Brüel & Kjær Multifunction Acoustic Calibrator Type 4226. The readings from the acoustic calibration are entered into the computer manually. When this is done, you can either print the certificate of calibration and worksheet, or store them electronically.

USES

- ❍ Acoustic and electrical calibration of sound level meters according to international standards
- ❍ Fast and accurate semi-automatic calibration of sound level meters

FEATURES

- ❍ Test signals according to IEC 651 and IEC 804 standards
- ❍ Tolerances set to sound level meter's IEC type
- ❍ Monthly and annual system calibration for quality measurements
- ❍ External electrical traceability via digital voltmeter
- ❍ External acoustic traceability via Brüel & Kjær's Multifunction Acoustic Calibrator Type 4226
- ❍ Predefined or user selectable sub-tests
- ❍ Complete calibration made possible in workshop environment
- ❍ User friendly test routines
- ❍ Certificate of calibration showing tests conducted
- ❍ Documented worksheet including detailed calibration results

Test Description

The following tests derive from IEC 651 and IEC 804 standards and are available with the calibration system

The following electrical tests are performed by removing the microphone from the sound level meter and replacing it with a capacitor.

DC output test (non-standard)
This test can only be performed on sound level meters with an output of 50 mV/dB DC. It verifies the relationship between the DC output and the sound level meter.

Self-generated noise (non-standard)
This test determines the noise produced by the sound level meter itself. Sub-tests are available using frequency weighting A, B, C, D, Lin and Lin–Lim.

Frequency weighting
Sound level meters are checked according to IEC 651 standard and type. Sub-tests are available using frequency weighting A, B, C, D, Lin and Lin–Lim.

Level range control
The sound level meter's level range is checked in relation to the reference range. Sub-tests are possible using frequencies of 20 Hz, 31.5 Hz, 1 kHz, 4 kHz, 8 kHz and 12.5 kHz.

Linearity range
Using 94 dB as a reference level, the overall SPL linearity and the differential SPL linearity are tested in a reference range from 2 dB above the lower limit to the upper limit in 10 dB and 1 dB steps at 20 Hz, 31.5 Hz, 1 kHz, 4 kHz, 8 kHz and 12.5 kHz. The overall L_{eq} linearity test is performed at 4 kHz using a continuous sine signal. The overall SEL linearity test is performed using a single tone burst signal with a frequency of 4 kHz at levels from 4 dB above lower limit to the upper limit of the reference range.

RMS detector
The RMS detector is tested according to the IEC standard for sound level meters using sine tone burst signals. The RMS detector's symmetry is tested by comparing the response of single square pulses of both polarities.

Time weighting
Five different time weighting tests can be performed as follows:

- Indication difference
- Single tone burst (Fast, Slow and Impulse)
- Repetitive tone burst (Impulse)
- Peak detector test
- Overshoot (Fast and Slow)

Test tolerances are according to IEC 651 and IEC 804.

Pulse range
This is checked by applying a single short duration tone superimposed in phase upon a sinusoidal baseline signal. The RMS value of this signal is calculated and used as reference for the test tolerances. All tolerances are according to IEC 804.

Time averaging
The sound level meter is checked by comparing the reading of a continuous sine signal and a sine tone burst signal with the same RMS value. Test tolerances are according to IEC 651 and IEC 804.

Overload
Tests can be performed for SPL and SEL. SPL is tested using an inverse A-curve and starts at 1 kHz, 5 dB below the specified maximum input level for the selected sound level meter. The frequency is decreased in 1/3-octave steps until overload is reached. SEL is tested using single tone burst signals. The test starts 5 dB below the specified maximum input level for the selected sound level meter. The level is then increased in steps of 1 dB until overload is reached.

Taktmaximal (non-IEC test)

Both “3s Taktmaximal” and “5s Taktmaximal” tests can be performed.

Acoustic response
On completion of the electrical test, the microphone is mounted on the sound level meter. The sound level meter is then tested complete with microphone using Brüel & Kjær’s Multifunction Acoustic Calibrator Type 4226.

Certificate of Calibration

On completion of each sound level meter calibration, a certificate of calibration is issued. If a single-sheet feed printer is connected to the system computer, then a single-page certificate (printed on both sides) can be issued.

The contents of the certificate are based on four files that can be compiled by the system operator according to his/her particular needs. The language of the certificate, for example, is selected by the operator. The system can also use pre-printed paper.

Calibration worksheet
It is also possible to print out a calibration worksheet after calibration. This includes results and data from every calibration sub-test. The worksheet is available in English only. You can store your worksheet electronically.

Ordering Information

Type 9600	Sound Level Meter Calibration System
Includes the following accessories:	
Type 1051	Sine Generator
Type 5918	Burst Generator
WQ 1089	Datron 1281 Voltmeter
Type 4226	Multifunction Acoustic Calibrator
WQ 1109	Personal Computer
WQ 1118	Laser printer
WF 0042	System rack
	Adaptors and cables for system
	Interface for computer and sound level meter

For further details please contact your local Brüel & Kjær office or Brüel & Kjær headquarters, Nærum, Denmark